Claims

1.   A method for forming a set of cells for time difference measurements for a mobile terminal camped on a first cell of a cellular network and being in idle mode, the method comprising the steps of:

5   receiving, at the mobile terminal, a first set of cell identifiers respectively associated with neighboring cells of the first cell, with each of the neighboring cells sending a radio signal;

        measuring, at the mobile terminal, received signal strengths of the neighboring cells having identifiers which are included in the first set of cell

10   identifiers, with a number N of cells having a signal strength exceeding a predefined threshold constituting a set of available cells;

        reading, at the mobile terminal, a synchronization channel for the set of available cells, thereby measuring time differences for the set of available cells;

        selecting, at the mobile terminal, a second set of cells from the set of

15   available cells using a predefined selection rule, the second set of cells including M < N cells, wherein the predefined selection rule causes a non-selection of a cell having a same cell identity as another cell in the set of available cells if it is probable that the cell which is not selected and the another cell belong to one sectorized base station; and

20   reading, at the mobile terminal, a synchronization channel for the second set of cells, thereby measuring time differences for the second set of cells.

2.   A method for forming a set of cells for time difference measurements for a mobile terminal as claimed in claim 1, wherein time differences

25   at the mobile terminal are measured only for cells in the second set of cells while an exit condition is not fulfilled.

3.   A method for forming a set of cells for time difference measurements for a mobile terminal as claimed in claim 2, wherein the exit

30   condition includes a counter exceeding a predefined limit value.

4. A method for forming a set of cells for time difference measurements for a mobile terminal as claimed in claim 2, wherein the exit condition includes a timer exceeding a predefined time limit.

5. A method for forming a set of cells for time difference measurements for a mobile terminal as claimed in claim 4, wherein the exit condition includes the mobile terminal changing from idle mode to dedicated mode.

6. A method for forming a set of cells for time difference measurements for a mobile terminal as claimed in claim 1, wherein a cell from the set of available cells is selected to the second set of cells whenever one of:

1) a base station identity code of the cell is not equal to a base station identity code of any other cell from the set of available cells; and

2) a base station identity code of the cell is equal to a base station identity code of any other cell from the set of available cells, and one of 2a) a measured time difference of the cell deviates from measured time differences for other cells sharing the same base station identity code more than a predefined threshold, and 2b) a signal strength of the cell is largest among all cells sharing the same base station identity code and the measured time difference of the cell deviates less than or equal to the predefined threshold.

7. A method for locating a user of a mobile terminal, the method comprising the steps of:

providing that the mobile terminal be camped on a first cell of a cellular network and is in idle mode;

receiving, at the mobile terminal, a first set of cell identifiers respectively associated with neighboring cells of the first cell, with each of the neighboring cells sending a radio signal;

measuring, at the mobile terminal, received signal strengths of the neighboring cells having identifiers which are included in the first set of cell

identifiers, with a number N of cells having a signal strength exceeding a predefined threshold constituting a set of available cells;

reading, at the mobile terminal, a synchronization channel for the set of available cells, thereby measuring time differences for the set of available cells;

selecting, at the mobile terminal, a second set of cells from the set of available cells using a predefined selection rule, the second set of cells including M < N cells, wherein the predefined selection rule causes a non-selection of a cell having a same cell identity as another cell in the set of available cells if it is probable that the cell which is not selected and the another cell belong to one sectorized base station;

reading, at the mobile terminal, a synchronization channel for the second set of cells, thereby measuring time differences for the second set of cells; and

using the time difference measurements to obtain the location of the user.

8. A method for locating a user of a mobile terminal as claimed in claim 7, wherein locationing is performed on the cellular network side in response to a transfer of the time difference measurements.

9. A method for locating a user of a mobile terminal as claimed in claim 8, wherein the transfer is performed in response to a call which is one of originated by the user and terminated to the user.

10. A method for locating a user of a mobile terminal as claimed in claim 9, wherein the call is an emergency service call.

11. A mobile terminal, comprising:

parts for receiving a first set of cell identifiers respectively associated with neighboring cells of a first cell of a cellular network on which the mobile terminal is camped, the mobile terminal being in idle mode, with each of the neighboring cells sending a radio signal;

parts for measuring received signal strengths of the neighboring cells having identifiers which are included in the first set of cell identifiers, with a number N of cells having a signal strength exceeding a predefined threshold constituting a set of available cells;

5   parts for reading a synchronization channel for the set of available cells, thereby measuring time differences for the set of available cells;

parts for selecting a second set of cells from the set of available cells using a predefined selection rule, the second set of cells including $M < N$ cells, wherein the predefined selection rule causes a non-selection of a cell having a same cell

10   identity as another cell in the set of available cells if it is probable that the cell which is not selected and the another cell belong to one sectorized base station;

parts for reading a synchronization channel for the second set of cells, thereby measuring time differences for the second set of cells; and

parts for using the time difference measurements to obtain a location of the

15   user.

12.   A mobile terminal as claimed in claim 11, wherein the mobile terminal is a GSM terminal.